

KEMENTERIAN PERDAGANGAN DALAM NEGERI
DAN HAL EHWAL PENGGUNA MALAYSIA,
BAHAGIAN HARTA INTELEK,
TINGKAT 27, 30 DAN 32,
MENARA DAYABUMI,
JALAN SULTAN HISHAMUDDIN,
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Ministry of Domestic Trade and Consumer Affairs Malaysia,
Intellectual Property Division

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To:

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MALAYSIA

PATENT APPLICATION NO: PI 2000 6078

This is to certify that annexed hereto is a true copy from the records of the Registry of Trade Marks and Patents, Malaysia of the application as originally filed which is identified therein.

By authority of the
REGISTERAR OF PATENTS

ABDUL RAHMAN RAMLI

(CERTIFYING OFFICER)

21 Febuary 2002



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Intellectual Property Division.*

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Fax : 03-22741332*

CERTIFICATE OF FILING

APPLICANT : PETROLIAM NASIONAL BERHAD
APPLICATION NO : PI 20006078
REQUEST RECEIVED ON : 21/12/2000
FILING DATE : 21/12/2000
AGENT'S/APPLICANT'S FILE REF. : SD/PAT/2316511/PKK/VS

Please find attached, a copy of the Request Form relating to the above application, with the filing date and application number marked thereon in accordance with Regulation 25(1).

Date : 11/01/2001

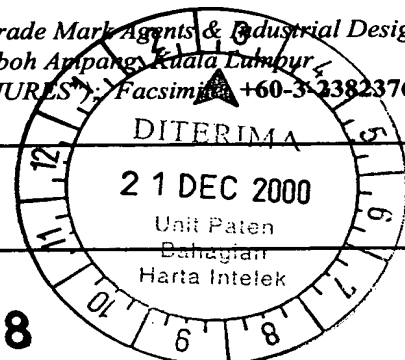

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(HASNON BT. ALANG MOHD RASHID)
for Registrar of Patents

To : WONG SAI FONG
M/s SHEARN DELAMORE & CO,
7TH FLOOR, WISMA HAMZAH-KWONG HING,
NO. 1, LEBOH AMPANG,
50100 KUALA LUMPUR
MALAYSIA

Patents Form 1 PATENTS ACT 1983 REQUEST FOR GRANT OF PATENT [Regulation 7(1)] To:-- The Registrar of Patents Patent Registration Office Kuala Lumpur, Malaysia	<p align="center"><u>FOR OFFICIAL USE</u></p> Application No. <u>P-20006078</u> Filing date: <u>21-12-00</u> Request received on: <u>21-12-00</u> Fee received on: <u>21-12-00</u> Amount: <u>260.00</u> Cheque No. <u>260-31408</u>
<i>Please submit this Form in duplicate</i>	Date of mailing: December 21, 2000 Agent's file reference: SD/PAT/2316511/PKK/VS
THE APPLICANT(S) REQUEST(S) THE GRANT OF A PATENT IN RESPECT OF THE FOLLOWING PARTICULARS.	
I. TITLE OF INVENTION OIL FILTER ADAPTOR FLANGE.	
II. APPLICANT(S) <i>(The data concerning each applicant must appear in this box or, if the space is insufficient, in the space below)</i> Name : PETROLIAM NASIONAL BERHAD. I.C./Passport no. : Address : Tower 1, Petronas Twin Towers, Kuala Lumpur City Centre, 50088, Kuala Lumpur, Malaysia. Nationality : A corporation organised and existing under the laws of Malaysia. *Permanent residence or principal place of business : - same as above - Address for service in Malaysia : SHEARN DELAMORE & CO. <i>Advocates & Solicitors, Notary Public, Registered Patent Agents, Trade Mark Agents & Industrial Design Agents</i> <i>7th Floor, Wisma Hamzah-Kwong Hing, No.1, Leboh Ampang, Kuala Lumpur</i> <i>Telephone: 03-2300644; Telex: MA 30379 (answerback "JUREL"); Facsimile: +60-3-2382376</i>	
Additional Information	

*Delete whichever does not apply

20006078



II. INVENTOR(S)

The Applicant(s) is/are the inventor(s):

Yes ☐

No ☒

If no, the Applicant(s) hereby designate(s) the following as inventor(s)

NAME

ADDRESS

1. AZMI B OSMAN

YED CO. LTD.

3622-8 Nishikaizuka,

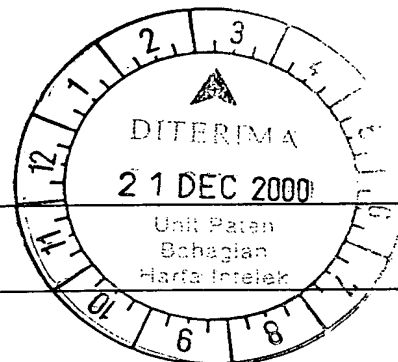
Iwata, Shizuoka 438-0026,

JAPAN.

(The inventor is a citizen of Malaysia.)

Additional inventors indicated on supplementary sheet ☐

Additional information



20006078

IV. AGENT OR REPRESENTATIVE

The Applicant(s) has/have appointed a patent agent in the accompanying Form 17
 Patent Agent's Registration number: PA 86/0003

Yes ☒
 No ☐

Applicants have appointed to be their common representative.

V. DIVISIONAL APPLICATION

This application is a divisional application: ☐

The benefit of the filing date ☐ and priority date ☐ of the initial application is claimed inasmuch as the subject matter of the present application is contained in the initial application identified below:

Initial application number:

Date of filing of initial application:

VI. DISCLOSURES TO BE DISREGARDED FOR PRIOR ART PURPOSES

(a) Disclosure was due to acts for the applicant or his predecessor-in-title ☐
 Date of disclosure:

(b) Disclosure was due to the abuse of rights of applicant or his predecessor-in-title ☐
 Date of disclosure:

A statement specifying in more detail the facts concerning the disclosure Yes ☐

Accompanies this Form No ☐

Additional information (if any)

VII. PRIORITY CLAIM (if any)

The priority of earlier applicant(s) is/are claimed as follows:-

Country*

Application no.

Filing date (dd/mm/yy)

-

-

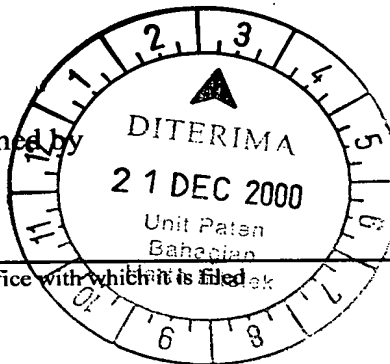
-

Symbol of the International Patent Classification:

If not yet allocated, please tick

The priority of more than one earlier application is claimed:

The certified copy of the earlier application(s) will be furnished by the patent agent upon request



*if the earlier application is a regional or international application, indicate the office with which it is filed

20006078

Additional information (if any)

VII. CHECK LIST

A. This application contains the following:

1.	Request (Form 1)	04	sheets
2.	description	08	sheets
3.	claim(s)	03	sheets
4.	abstract	01	sheets
5.	drawings (if any)	03	sheets

TOTAL

19

B. This Form, as filed, is accompanied by the items checked below:

- | | | |
|----|---|-------------------------------------|
| a. | signed Form No. 17 | <input checked="" type="checkbox"/> |
| b. | declaration that inventor does not wish to be named in the patent | <input type="checkbox"/> |
| c. | statement justifying applicant's right to the patent | <input checked="" type="checkbox"/> |
| d. | statement that certain disclosure be disregarded | <input type="checkbox"/> |
| e. | priority document (certified copy of earlier application) | <input type="checkbox"/> |
| f. | cheque, cash, etc. for the payment of application fee | <input checked="" type="checkbox"/> |
| g. | other documents (specify) | <input type="checkbox"/> |

IX. SIGNATURE



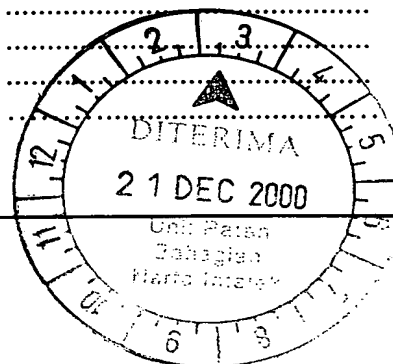
Name: WONG SAI FONG
Regn : PA 86/0003

DECEMBER 21, 2000

Date

For official use:

1. Date application received:
2. Date of receipt of correction, later filed papers, or drawings completing the application.



20006078

**STATEMENT JUSTIFYING
APPLICANT'S RIGHT TO THE INVENTION**

- I. Application Number :
- II. Agents file reference : **SD/PAT/2316511/PKK/VS**
- III. Applicant : **PETROLIAM NASIONAL BERHAD.**
- IV. Title of invention : **OIL FILTER ADAPTOR FLANGE.**
- V. Pursuant to Regulation 10(2) of the Patents Regulation 1986 I believe that the inventor(s) of the above-stated application is/are as follows: -

NAME

ADDRESS

1. AZMI B OSMAN

YED CO. LTD.

3622-8 Nishikaizuka,

Iwata, Shizuoka 438-0026,

JAPAN.

- VI. **STATEMENT JUSTIFYING THE APPLICANT'S RIGHT TO THE INVENTION** in accordance with Regulation 10(2) of the Patents Regulations 1986:
The applicant's right to the invention is by virtue of contract of employment with the inventor.

- VII. Signature



Name: WONG SAI FONG
Regn : PA 86/0003

DECEMBER 21, 2000
Date

20 006 078

OIL FILTER ADAPTOR FLANGE

Field of the Invention

This invention relates to an oil filter adaptor flange and particularly, though not exclusively, to an oil filter adaptor flange to enable the correct positioning and attachment of an oil filter of an internal combustion or diesel engine. The present invention also relates to an adaptor, preferably for use with the flange.

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Background to the Invention

With modern automotive design significant emphasis is given to the coefficient of distortion, which determines the efficiency with which the automobile progresses through the air. In consequence, the size of the engine compartment of automobiles is being reduced. This is happening at the same time that extra space is required for anti-pollution equipment, fuel injection, cross-flow heads, overhead camshafts, and so forth.

10

The oil filter of an engine is known to occupy a significant space within the engine compartment. This explains why the oil filter is placed in many different locations, and orientations. The oil filter can be mounted on the cylinder block or ladderframe vertically (either upwardly or downwardly) or horizontally either at the front or back, and can be mounted oriented forwardly, rearwardly or sideways, depending on the available space. Furthermore, it is

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common for one engine series to be fitted in different vehicles. As a result, engine designers chose to use oil filter adaptors rather than a fixed oil filter housing. This ensures that the high cost of modifying the cylinder block or ladderframe mold to suit different vehicles can be avoided.

5 With oil filter adaptors, either extending or shortening the adaptor can avoid obstacles like vehicle drive shafts or exhaust pipes. Even with conventional oil filter adaptors, the choice of location of the oil filter is still limited. This is because the flange at the ladderframe or cylinder block where the oil filter adaptor will be attached enables only either upwards and downwards, or

10 forwards and rearwards, directions. It is difficult for one flange to be used with four different orientations without changing the cylinder block or ladderframe.

It is therefore the principal object of the present invention to provide an oil filter adaptor flange capable of being combined with the oil filter adaptor for multi-orientation mounting.

15 A further object of the present invention is to provide an oil filter adaptor flange which enables the engine to be used in many different vehicles, including those with north-south, west-east, and east-west engine orientations. Yet another object of the present invention is to provide an oil filter adapter flange which allows flexibility in the orientation of the filter to enable vehicle

20 designers to provide for ease of access by motorists and mechanics performing servicing of the engine.

Summary of the Invention

With the above and other objects in mind, the present invention provides a flange for an oil filter adaptor, the flange having a peripheral sealing portion adapted to be contacted by and seal with a correspondingly sized and shaped mounting flange of the oil filter adaptor; the peripheral sealing portion defining at least one inlet opening and at least one outlet opening with at least one divider between the at least one inlet opening and the at least one outlet opening, the at least one divider extending between a first section of the peripheral sealing portion and a second section of the peripheral sealing portion, the first section being remote from the second section.

Preferably, the peripheral sealing portion is substantially rectangular in shape, the first section being a first corner of the rectangle, the second section being a second corner of the rectangle, the first corner being diagonally opposite the second corner. More preferably, the at least one inlet opening is substantially triangular, as is the at least one outlet opening. The at least one inlet opening may be the same size and shape as the at least one outlet opening.

There is preferably one inlet opening, and one outlet opening.

The at least one divider has an outer surface which may be co-planar with a mating surface of the peripheral sealing portion, and there may be one divider.

The present invention also relates to an engine block including such a flange.

In another form, the present invention provides an adaptor for an oil filter having an oil filter receiving portion, a body, and a mounting flange; the mounting flange having a first opening therethrough in operative communication with a first passage through the body and the oil filter receiving portion, and a second opening therethrough in operative communication with a second passage through the body and the oil filter receiving portion; the first opening and the second opening being separated by a divider, and the first passage and the second passage being separated by a barrier, the divider and the barrier being operatively connected.

Advantageously, the mounting flange is substantially rectangular and has a first corner and a second corner diagonally opposite the first corner, the divider extending between the first corner and the second corner. In consequence, the first opening may be substantially triangular, as may be the second opening. The first and second openings may be of different shapes and/or sizes.

Preferably, the divider has an outer surface which is co-planar with a mounting surface of the mounting flange.

Description of the Drawings

In order that the invention may be better understood and readily be put into practical effect, there shall now be described by way of non-limitative example only preferred embodiments of the present invention, the description being with reference to the accompanying illustrative drawings in which:

Figure 1 is a plan view showing the flange of the present invention;

Figure 2 is a perspective view of an oil filter adaptor with the mating face downwardly;

Figure 3 is a cross-sectional view along the lines and in the direction of arrows 3-3 on Figure 2;

Figure 4 is a rear view of the adaptor of Figure 2;

Figure 5 is an exploded perspective view showing the manufacturing of the adaptor of Figure 2 to 4; and

Figure 6 is a rear view of Figure 5.

Description of Preferred Embodiments

As is shown in Figure 1 there is a ladderframe of a cylinder block 8 having a flange 10 with a peripheral sealing portion 12 which, as shown, is substantially rectangular. It has a mating surface 14 which is adapted to sealingly receive an oil filter adaptor 16 such as that shown in Figures 2 to 6. The flange 10 has four corners 18 with there being a diagonal divider 20 extending between two diagonally opposite corners. The divider 20 has an outer surface 22 which is coplanar with mating surface 14. Bolt holes 24 are provided in the normal manner. The divider 20 divides flange opening 26 into a opening 28 and a second opening 30. Openings 28, 30 are both substantially triangular and are of identical size and shape, and thus area. With such an arrangement, the openings 28, 30 will provide inflow and outflow which is sufficient for each orientation of the adaptor 16, and thus the oil filter (not shown).

In Figure 1, the left side of the ladderframe is the front, whereas the right side is the rear side of the ladderframe.

The passage 30 is connected to the long passage extending from the front side whereas the passage 28 is connected to an upward passage which is connected to the cylinder block 8.

5 The flange 10 is to provide enough support for the combined weight of oil filter adaptor 16, oil cooler (not shown) and the oil filter (not shown) during engine operation. The openings 28, 30 enable a long die to be used to provide channels for the oil flow. Moreover, uniform wall thickness can be maintained and bulky material concentration can be avoided.

10 As the flange 10 has its openings 28, 30 shaped and sized identically but with a diagonal divider 20, the oil filter adaptor 16 can be designed to have its inlet and outlet positioned to be over the openings 28, 30. Up to four different oil filter adaptors can be designed corresponding to upward, downward, backward and frontward.

15 The conventional oil filter adaptor has its inlet and outlet oil channels drilled. This machining operation can be expensive because the channels are long and cannot be drilled in a single operation (in those cases where the distance between the two drills is less than 30mm).

20 With some modification to the overall shape, it is possible to avoid those two drilling operations. In order to eliminate the drilling operations, the opening areas of the inlet and outlet must be big enough to enable two dies to be used to provide the inlet and outlet channels.

Figures 2 to 4 show the oil filter adaptor 16 with its oil filter receiving portion 32 facing downwardly. The flange 10 will provide enough support for the combined weight of the oil filter adaptor 16, oil cooler (not shown) and the oil filter (not shown) during engine operation. The adaptor 16 also has a body 34 and a mounting flange 36. The flange 36 has a first opening 38 operatively connected to a first passage 40 passing through body 34 and oil filter receiving portion 32; as well as a second opening 42 operatively connected to a second passage 44 passing through body 34 and oil filter receiving portion 32. A divider 46 separates the openings 38, 42; and a barrier 48 separates the passages 40, 44. The divider 46 and barrier 48 are operatively connected.

The openings 38, 42 are both generally triangular but are of different sizes. Neither is larger than the openings 28, 30, although it is preferred that opening 38 is generally the same size and shape as openings 28, 30. In this way, in a first orientation, opening 38 completely overlies opening 28. As opening 42 is smaller than opening 30, there is still full oil flow therebetween, and no sealing difficulties.

If adaptor 16 is rotated 180°, opening 38 overlies opening 30; and opening 42 overlies opening 28. Again, full oil flow and no sealing difficulties as openings 28, 30 are substantially identical.

The relatively large openings 38, 42 also enable a long die to provide passages 40, 44. Moreover, uniform wall thickness can be maintained and bulky material concentration can be avoided.

From Figure 5 and 6, die 50 provides protrusions to shape the inlet, outlet and bolt holes; die 52 shapes the top of the adaptor; and die 54 provides protrusions to shape a round shape for the inlet passage for the oil to enter the filter. A small portion of the die 54 will almost contact die 50 in order to create the smaller opening 42 for oil to flow in.

The flange 10 can be used on a ladderframe, bedplate on cylinder block.

Whilst there has been described in the foregoing description preferred embodiments of the present invention, it will be understood by those skilled in the technology that many variations in details of design or construction may be

10 made without departing from the present invention.

The Claims

1) A flange for an oil filter adaptor, the flange having a peripheral sealing portion adapted to be contacted by and seal with a correspondingly sized and shaped mounting flange of the oil filter adaptor; the peripheral sealing portion defining at least one inlet opening and at least one outlet opening, there being at least one divider between the at least one inlet opening and the at least one outlet opening, the at least one divider extending between a first section of the peripheral sealing portion and a second section of the peripheral sealing portion, the first section being remote from the second section.

2) A flange as claimed in claim 1, wherein the peripheral sealing portion is substantially rectangular in shape, the first section being a first corner of the rectangle, the second section being a second corner of the rectangle, the first corner being diagonally opposite the second corner.

3) A flange as claimed in claim 1 or claim 2, wherein the at least one inlet opening is substantially triangular.

4) A flange as claimed in any one of claims 1 to 3, wherein the at least one outlet opening is substantially triangular.

5) A flange as claimed in any one of claim 1 to 4, wherein the at least one inlet is the same size, shape and area as the at least one outlet opening.

6) A flange as claimed in any one of claims 1 to 5, wherein there is one inlet opening.

7) A flange as claimed in any one of claims 1 to 6, wherein there is one outlet opening.

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8) A flange as claimed in any one of claims 1 to 7, wherein the at least one divider has an outer surface which is co-planar with a mating surface of the peripheral sealing portion.

9) A flange as claimed in any one of claims 6 to 8, wherein there is one divider.

10

10) A flange as claimed in any one of claims 1 to 9 when included with any one of the items selected from the list consisting of: an engine block, a ladderframe, and a bedplate.

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11) An adaptor for an oil filter having an oil filter receiving portion, a body, and a mounting flange; the mounting flange having a first opening therethrough in operative communication with a first passage through the body and the oil filter receiving portion, and a second opening therethrough in operative communication with a second passage through the body and the oil filter receiving portion; the first opening and the second opening being separated by a divider, and the first passage and the second passage being separated by a barrier, the divider and the barrier

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being operatively connected.

- 12) An adaptor as claimed in claim 11, wherein the mounting flange is substantially rectangular and has a first corner and a second corner diagonally opposite the first corner, the divider extending between the first corner and the second corner.

- 13) An adaptor as claimed in claim 11 or claim 12, wherein the first opening is substantially triangular.

- 14) The adaptor as claimed in any one of claims 11 to 13, wherein the second opening is substantially triangular.

- 15) An adaptor as claimed in any one of claims 11 to 14, wherein the first opening and the second opening are of different sizes.

- 16) An adaptor as claimed in any one of claims 11 to 15, wherein the divider has an outer surface which is co-planar with a mounting surface of the mounting flange.

Abstract**Oil Filter Adaptor Flange**

A flange for an oil filter adaptor, the flange having a peripheral sealing portion adapted to be contacted by and seal with a correspondingly sized and shaped mounting flange of the oil filter adaptor; the peripheral sealing portion defining at least one inlet opening and at least one outlet opening with there being at least one divider between the at least one inlet opening and the at least one outlet opening, the at least one divider extending between a first section of the peripheral sealing portion and a second section of the peripheral sealing portion, the first section being remote from the second section. An adaptor for use with the flange is also disclosed.

Figure 1

OIL FILTER ADAPTOR FLANGE

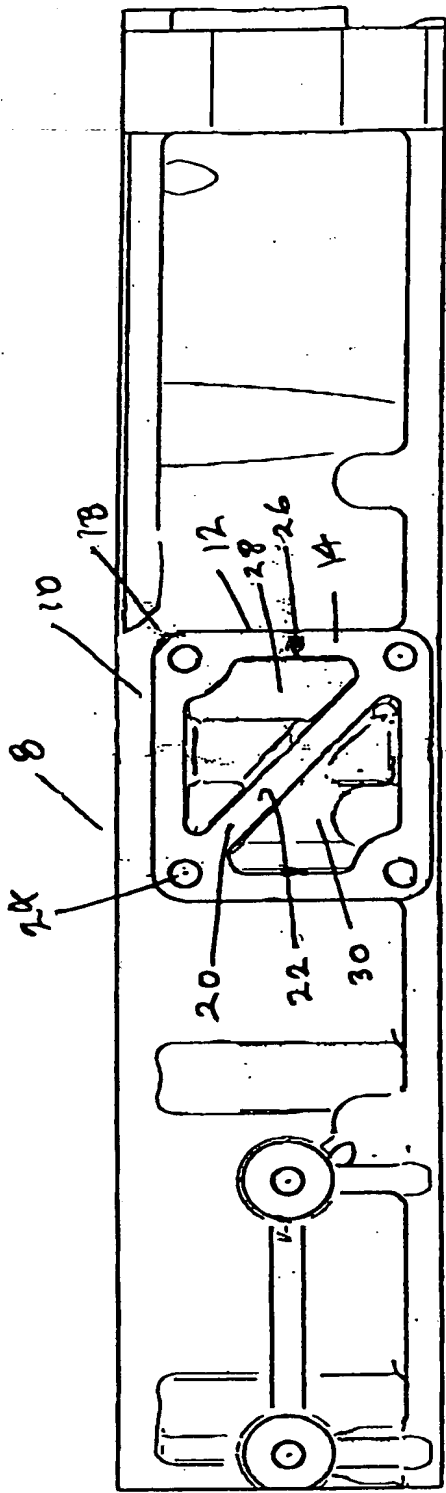


Figure 1

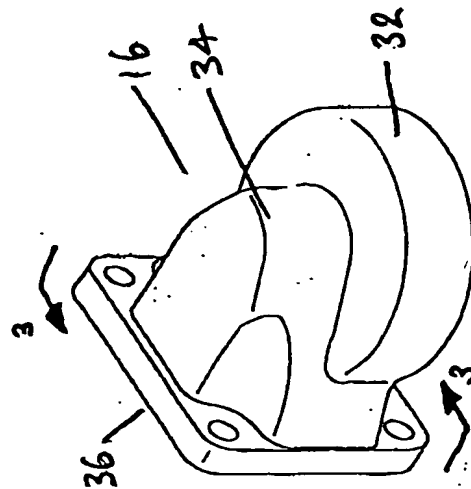


Figure 2

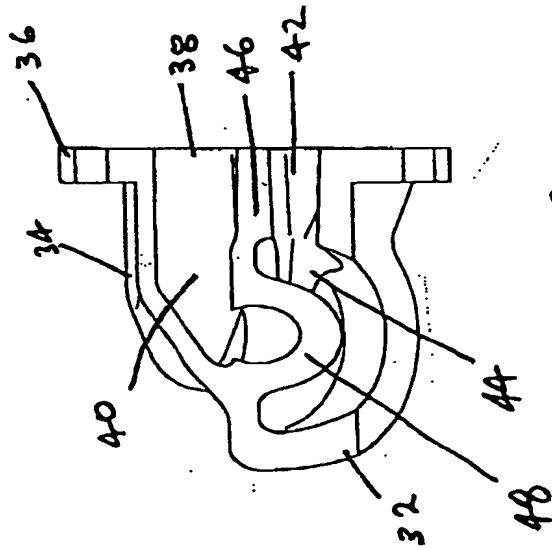


Figure 3

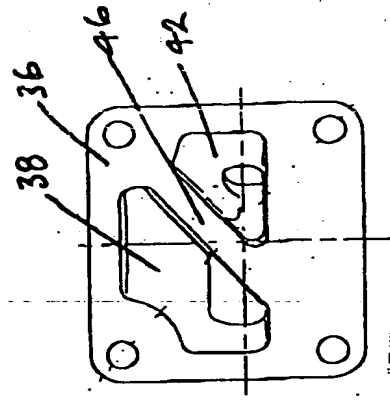
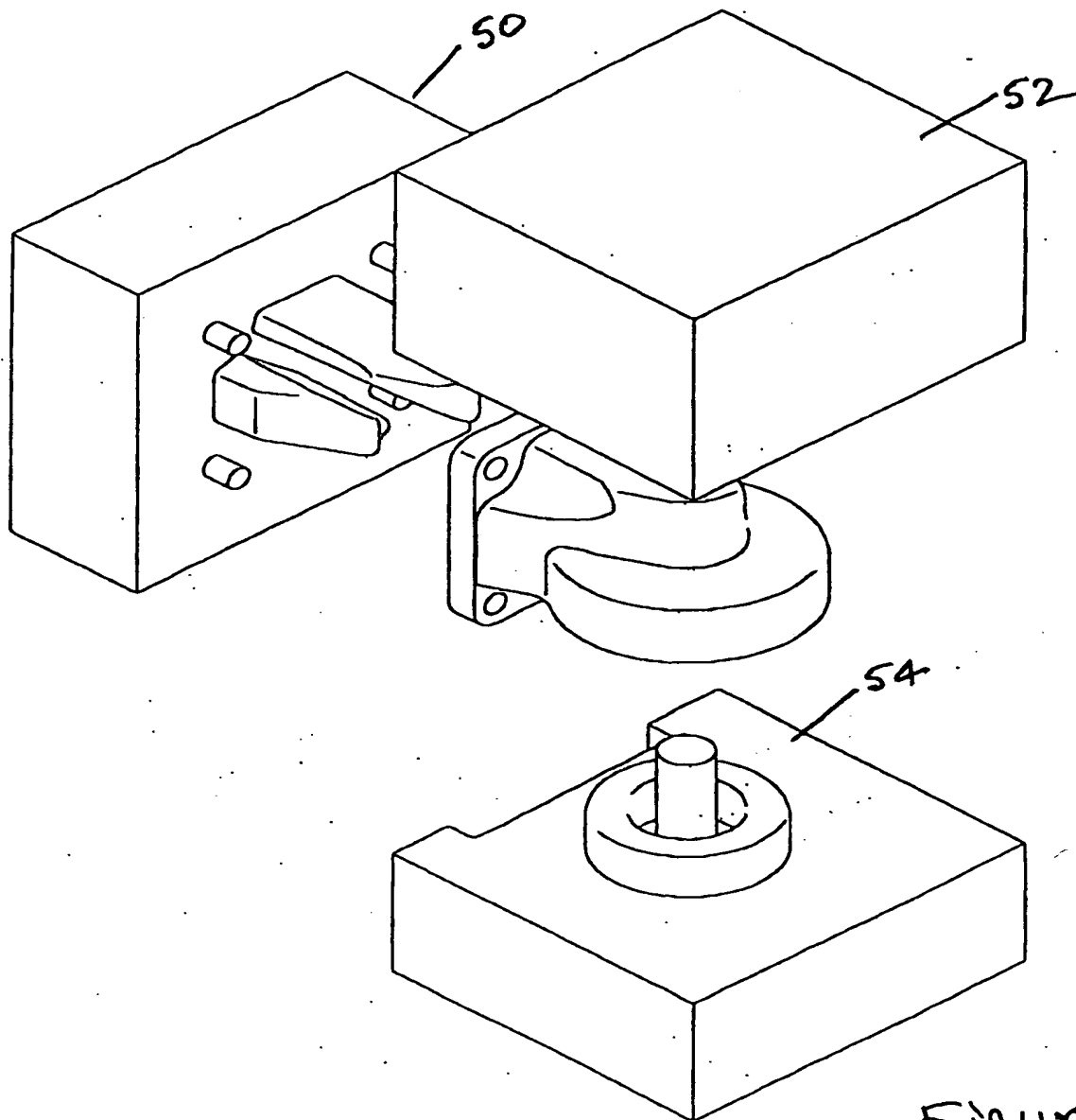
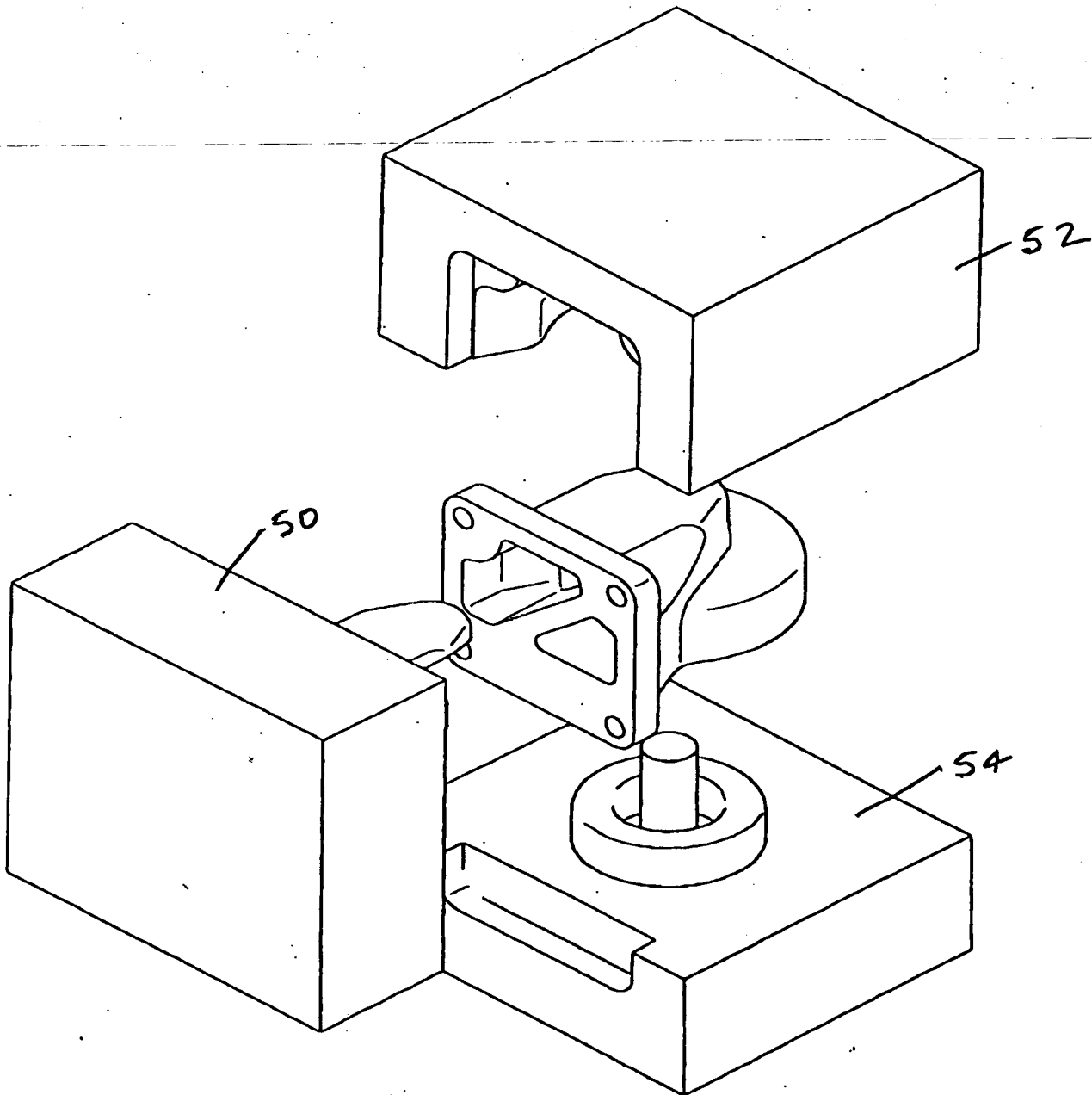


Figure 4

OIL FILTER ADAPTOR FLANGEFigure 5

OIL FILTER ADAPTOR FLANGEFigure 6